CHAPTER 2

HAZARDS IDENTIFICATION AND RISK ANALYSIS

The Crook County Emergency Management Agency, along with the Wyoming State Geological Survey, identified 17 potential hazards that could affect Crook County, 13 of which were considered to be significant and potentially life threatening. Definitions and explanations of all potential hazards are below.

Dam Failure: Dam failure is the uncontrolled release of impounded water resulting in downstream flooding, which can affect life and property. Flooding, earthquakes, blockages, landslides, lack of maintenance, improper operation, poor construction, vandalism, or terrorism can cause dam failures.

Drought: Drought is described as a protracted period of deficient precipitation resulting in extensive damage to vegetation.

Earthquake: A sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of the earth's tectonic plates.

Expansive Soils: Expansive soils contain clays that have the potential to swell and shrink when they become wetted or dried. Expansive soils can have significant impact on roads, bridges and other transportation facilities, as well as on buildings. These soils exist in portions of western Crook County. According to the Wyoming Multi-Hazard Mitigation Plan Crook County has over $3.5 million in buildings built on or over expansive soils. However, there is little actual damage reported in Crook County from expansive soils. It is suspected that most problem areas are being dealt with during construction.

Flood / Flash Flood: A general and temporary condition of partial or complete inundation of normally dry land areas from (1) the overflow of inland or tidal waters, (2) the unusual and rapid accumulation or runoff of surface waters from any source, or (3) mudflows or the sudden collapse of shoreline land. Flash flood: a flood event occurring with little or no warning where water levels rise at an extremely fast rate.

Hail: Hail is ice that forms, grows and ultimately falls from thunderclouds. Severe storms can drop enough hail to blanket the ground, flatten crops or clog storm sewers.

Hazardous Materials: As defined by the U.S. Department of Transportation (DOT), is one that poses an unreasonable risk to health and safety of operating or emergency personnel, the public, and/or the environment if not properly controlled during handling, storage, manufacture, processing, packaging, use, disposal, or transportation.

Landslide: A downward movement of a slope and materials under the force of gravity.

Land Subsidence: Land subsidence is a gradual settling or sudden sinking of the Earth's surface owing to subsurface movement of earth materials. In Wyoming this is often associated with roof collapse of mined-out areas. There are 7 abandoned underground coal mines, at least 15 abandoned hard rock mines, and 3 underground uranium mines in Crook County. There is no evidence of subsidence associated with the mined-out areas in Crook County, but future development in these areas should be limited until the areas are properly reclaimed.

Lightning: Lightning is a sudden electrical discharge released from the atmosphere that follows a course from cloud to ground, cloud to cloud, or cloud to surrounding air, with light illuminating its path. Lightning's unpredictable nature causes it to be one of the most feared and deadly weather elements.

Severe Winter Storm: A winter storm can range from a moderate snow over a few hours to blizzard conditions with blinding wind-driven snow that lasts several days.

Tornadoes: Tornadoes are violently rotating column of air extending from a thunderstorm to the ground.

Urban Fire: Urban fire is described as fire usually in manmade structures within a developed city / town that has the ability to spread from one structure to another.

Windstorms: Windstorms are the violent movement of air across the surf of the earth causing damage to assets. Damaging windstorms are not common in Crook County, but they have occurred.

Windblown deposits: Windblown deposits include areas of shifting silts and sands that can encroach on development, roads, and agricultural areas. Some windblown deposits are located in northwestern and southwestern Crook County, but are not known to have caused problems. If these deposits are disturbed, they could potentially destabilize.

Wildfire: An uncontrolled fire spreading through vegetation fuels, exposing and possibly consuming structures.

Volcanism and Yellowstone Volcanic Explosion: Very large-scale explosive volcanic activity has occurred in the Yellowstone area within the past 2.5 million years, which, in geologic time, is very recent. The volume and extent of volcanic materials produced from past eruptions at Yellowstone were immense. It is possible that another eruption of similar magnitude will occur, but probably not within the next 20,000 or more years.

Because of the overly long expected occurrence of frequency (greater than 10,000 years) for explosive volcanism at Yellowstone, and the fact that effective mitigation for an event of this low frequency and magnitude is difficult, it was not analyzed further in this document.

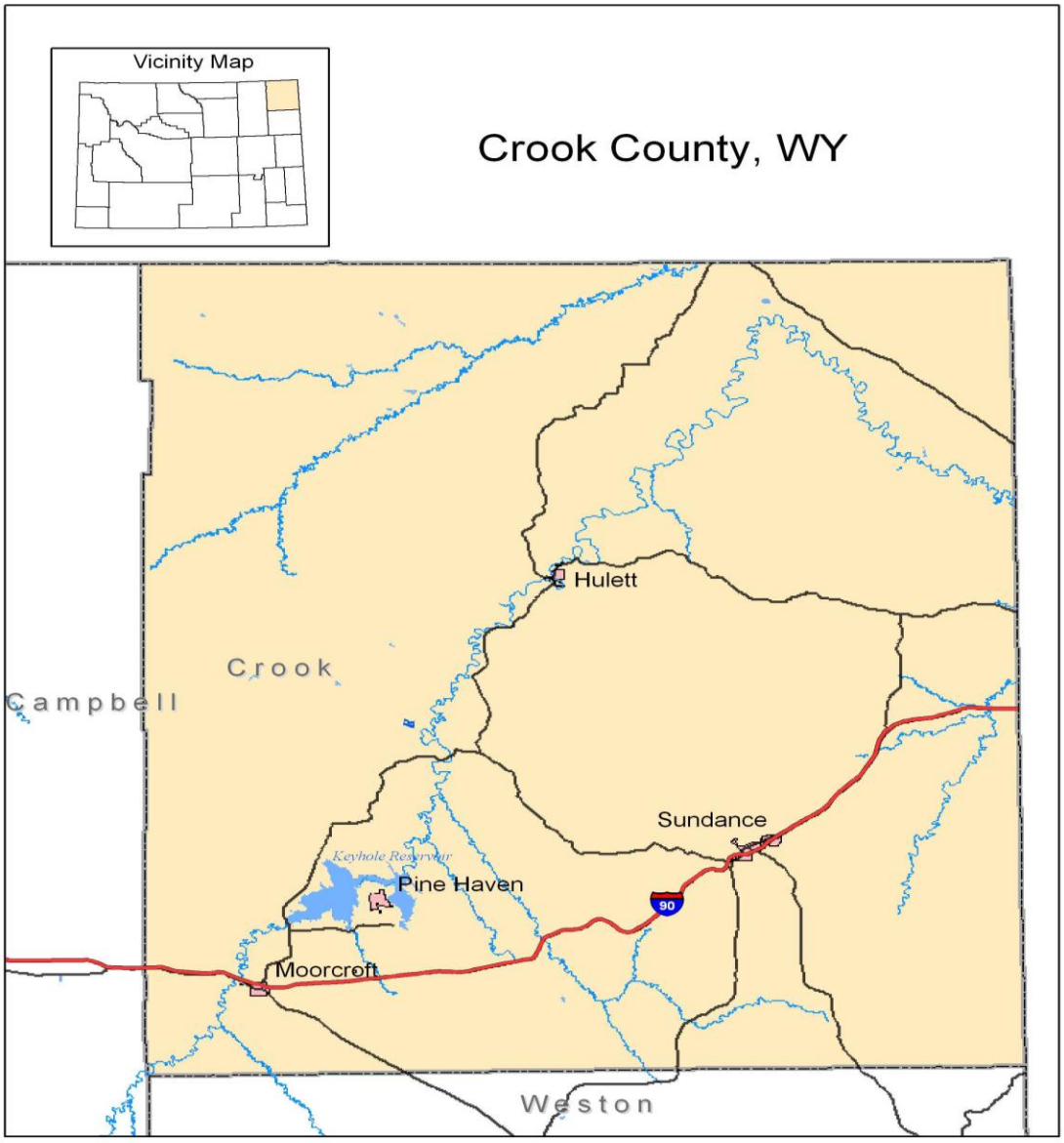

Figure 2.1 Crook County

Hazards Risk Analysis

Based on the histories and potential future occurrences of hazards that may cause significant impacts in Crook County, the LEPC selected the following to be addressed in more detail in the hazard-specific chapters of this plan: dam failures, droughts, earthquakes, expansive soils, floods, hail, hazardous materials spills, landslides, land subsidence, lightning, tornadoes, wildfire, and winter storms. Hazards that were not addressed further were those that were not likely to occur in the next 100 years or those that have not had a historical impact on property or life safety.

At the end of each of the following hazard-specific chapters there is a summary of the risk to people and property for each hazard. The probability of the hazard occurring is assessed as well. The Crook County Emergency Management Agency generated a ranking of hazards to determine the most significant potential threats posed by natural and man-made hazards. The attached hazard analysis is based on a high, medium, and low level of risk, as defined below, based on past history and the potential for future occurrence.

High: This ranking carries the highest threat. The potential of this hazard occurring in the assessment area is considered a matter of "when" it will occur, as opposed to "if" it will occur. The potential for damage is widespread. Hazards in this category may have already occurred in the past.

Medium: This ranking carries a moderate threat level to the general population. The potential of occurrence may be the same as the "high" ranking but the potential damage is more isolated and less costly than a more widespread disaster.

Low: The lowest ranking in the survey, the occurrence, and potential cost of damage to life and property is minimal.

Jurisdiction(s) Affected: This indicates how widespread the hazard is within the county, and where the risk varies across the planning area.

The probability of occurrence of each hazard was ranked using an estimate of high, medium, or low.

High: Event has occurred or is expected to occur within 5 years.

Medium: Event has occurred or is expected to occur every 5-100 years.

Low: Event has occurred or is expected to occur every 100 years or longer.